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SHORT REPORT

# Echo-Free Space and Intimal Micro-Tear: Initiating Event or Decompression Rent of Intramural Haematoma?

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**Abstract** A 52-year-old man with hypertension and prior ascending aorta reconstruction presented with an acute, type B intramural haematoma. The patient was managed by medical therapy and was closely followed up with trans-oesophageal echocardiography. At 36 months, we observed an asymptomatic echo-free space across the aortic, isthmic intramural haematoma associated with single 'intimal micro-tear'. At 1-month follow-up, the echo-free space had been completely absorbed.



## Introduction

Aortic intramural haematoma (IMH) represents a variant form of the so-called acute aortic syndrome. Recent advances in imaging techniques have significantly improved the diagnosis and heightened the clinical understanding of IMH, accounting for an increase in frequency of 10–30% of all acute aortic syndromes. Sometimes, the trans-oesophageal echocardiogram (TEE) shows a large 'echo-free space' (EFS), characterised by a focal contrast enhancement in computed tomography (CT), which might suggest a small flow communication through the 'intimal micro-tear'. The prognostic implications and potential association with the development of typical aortic dissection (AD) are often not seriously investigated.

## Report

A 52-year-old man, with a history of hypertension and prior ascending aorta reconstruction in 1996 for type A intramural haematoma (IMH), presented with acute chest pain radiating to the back (October 2004). Initial physical examination revealed symmetric, high blood pressure (170/100 mmHg). A CT scan showed an acute, type B IMH extending from the left hemi-arch to the descending thoracic aorta (Fig. 1). The patient was admitted to the intensive care unit, where intravenous (nitroprussate) and oral (β-adrenoreceptor blockers) antihypertensive agents were administered to control and maintain systolic blood pressure between 100 and 120 mmHg.

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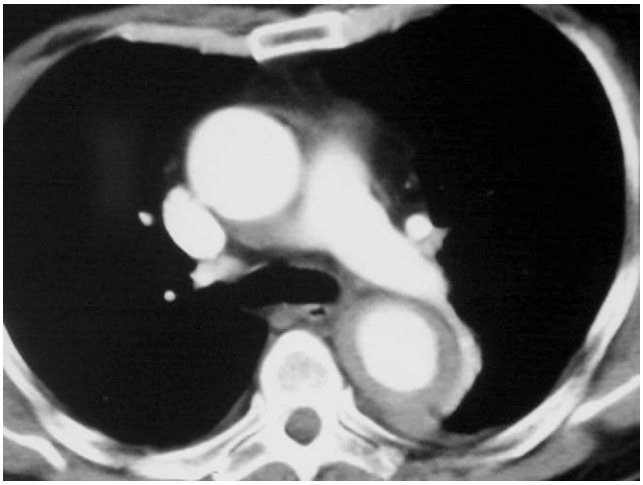

**Figure 1** A CT scan showing an acute type B IMH with a thickness of 8 mm.

After 7 days of aggressive pharmacological therapy, the blood pressure and symptoms were stabilised. The patient was discharged with a prescription for oral β-blocker drugs and was closely followed up with imaging techniques (TEE) until complication-free absorption of the IMH was observed. At 36 months of follow-up, TEE (SIEMENS Acuson Sequoia with multiplanar probe) showed an increase of the IMH thickness (11 mm) associated with a crescent-like EFS (Fig. 2A) across the aortic, isthmic IMH and a single 'intimal micro-tear' (2 mm in diameter) (Fig. 2B). At this level, the aortic diameter was measured to be 38 mm. However, the patient was asymptomatic and the blood pressure was normal (120/70 mmHg), and it was, therefore, decided to continue management with medical therapy. At the 1-month follow-up, the EFS was completely absorbed and the thickness of the IMH had reduced (7 mm diameter) (Fig. 3).

## Discussion

Several studies have suggested that patients with type B aortic IMH have a favourable short-term prognosis. Complete resolution of type B IMH has been documented in 50—80% of patients. Sueyoshi et al. reported that aortic diameter and thickness less than 40 and 10 mm, respectively, are favourable prognostic factors for the type B IMH regression.[1] It has been reported that the IMH with ulcer-like projection (ULP) or penetrating atherosclerotic ulcer (PAU) has been associated with a progressive disease course. Ganaha et al. suggested that the presence of sustained or recurrent pain, increasing pleural effusion and increase in both, the maximum diameter and the maximum depth of the PAU, were reliable predictors of disease progression, with the measurement of the maximum aortic diameter alone lacking prognostic value.[2]

Despite the frequent detection of EFS during TEE in patients with type B IMH, the exact pathogenetical mechanism remains unclear. Some investigators described the EFS as presenting as a 'pool of blood' within the haematoma, but it is not certain if the 'blood' comes from the true lumen through an intimal tear or results from a simple liquefaction of the haematoma.[3] There have been some reports that have demonstrated the intimal-tear site in patients with IMH by the use of a surgical specimen.[4] Nevertheless, the presence of EFS and 'intimal micro-tear' did not appear to be a predictor either of the development of aortic dissection (AD) or of poor clinical outcome in patients with type B IMH.

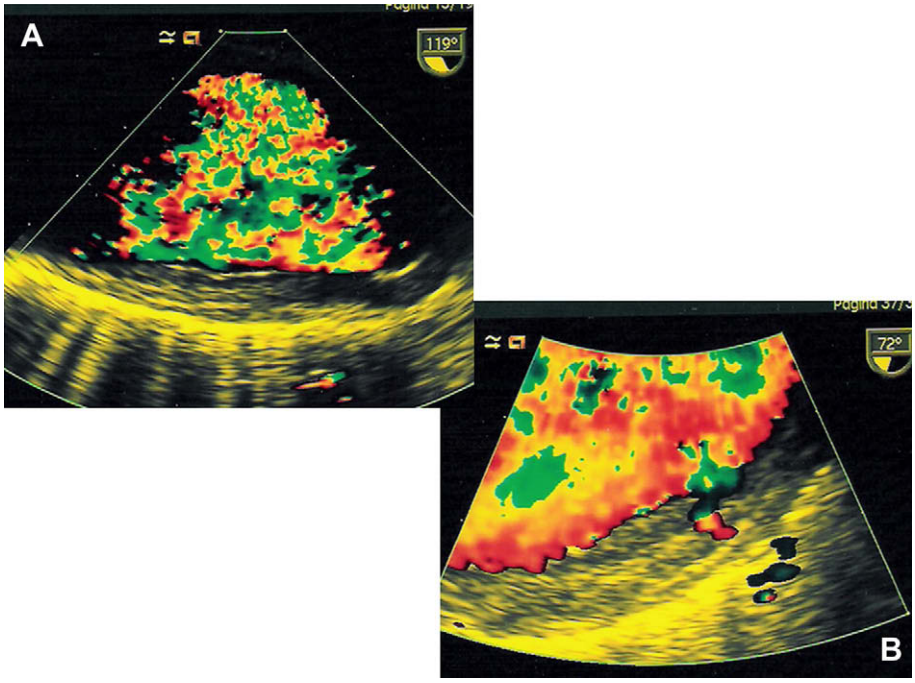


**Figure 2** TEE demonstrates (A) a crescent-shaped echo-free space across the aortic isthmic IMH and (B) a single 'intimal micro-tear'.

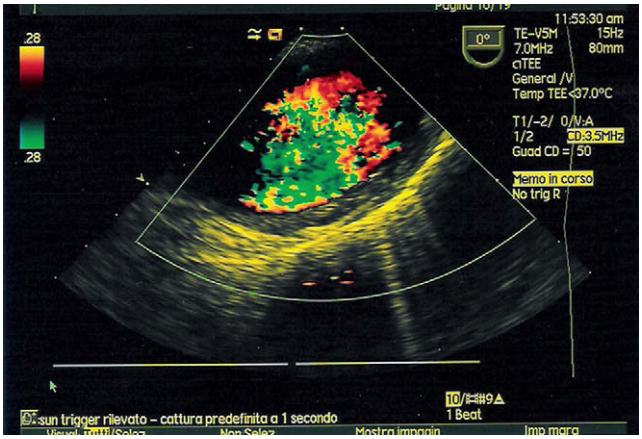


**Figure 3** TEE at the 1-month follow-up shows complete resolution of echo-free space and reduction in thickness of IMH.

Patients with type B IMH have better long-term prognosis than patients with type B AD. Although the prevalence of EFSs on TEE has been high, the exact pathogenetic mechanism of its development remains uncertain. Further investigation is necessary to verify whether the 'micro-tear' of the large EFS is an initiating event of IMH or of a decompression rent.

## Conflict of Interest

The authors have no conflict of interest.

## References

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